



MONARCH INSTRUMENT

Instruction Manual



Monarch 308
Mini Dual Channel Thermometer

15 Columbia Drive
Amherst, NH 03031-2334 USA
Phone: (603) 883-3390
Fax: (603) 886-3300
E-mail: support@monarchinstrument.com
Website: www.monarchinstrument.com

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1071-8031-310



Safeguards and Precautions



- 1. Read and follow all instructions in this manual carefully, and retain this manual for future reference.**
- 2. Do not use this instrument in any manner inconsistent with these operating instructions or under any conditions that exceed the environmental specifications stated.**
- 3. Making measurements of high or low temperatures can be dangerous. Keep the hand holding the temperature probe well away from the object being measured.**
- 4. This instrument is not user serviceable. For technical assistance, contact the sales organization from which you purchased the product or Monarch Instrument directly.**

LIMITED WARRANTY

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This limited warranty does not extend or apply to consumables (including, but not limited to, lamps and batteries, if applicable) or equipment, instruments or accessories which are warranted separately by the original manufacturer of these items.

DECLARATION OF CONFORMITY

Monarch Instrument

Division of Monarch International Inc.
15 Columbia Drive, Amherst NH 03031 USA


declares that the product:

Name: Thermometer, Mini Dual Channel, Type K
Model: Monarch 308

to which this declaration relates is in conformity with the following standards:

EMC: EN55022/1998, CISPR 22, Class B
EN50082-1/1997 / EN 61000-4

and therefore conforms in accordance with 89/336/EEC-EMC Directive. The testing of this product was performed by GesTek EMC Lab. in July and August of 2000. (Ref. No. 0007017E).



4th August 2000
Importer (Amherst,NH)

Alan Woolfson, VP Engineering (Authorized Signature)

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1.0 Introduction:

This instrument is a dual channel digital thermometer for use with any Type K thermocouple as a temperature sensor. Temperature indication complies with the NIST and IEC584 temperature/voltage tables for Type K thermocouples.

2.0 Specifications:

Measurement Range: -200°C - 1370°C -328°F - 2498°F

Accuracy: (At ambient of 23 ± 5°C)

Range	Accuracy
-200°C - 200°C	±(0.3% reading + 1°C)
200°C - 400°C	±(0.5% reading + 1°C)
400°C-1370°C	±(0.3% reading + 1°C)
-328°F - -400°F	±(0.5% reading + 2°F)
-200°F - 200°F	±(0.3% reading + 2°F)
200°F - 400°F	±(0.5% reading + 2°F)
400°F - 2498°F	±(0.3% reading + 2°F)

Temperature Coefficient:

For ambient temperatures from 0°C - 18°C and 28°C - 50°C, for each °C ambient below 18°C or above 28°C add the following tolerance into the accuracy spec.
0.01% of reading + 0.03°C
(0.01% of reading + 0.06°F)



Note:

The basic accuracy specification does not include the error of the probe. Please refer to the probe accuracy specification for additional details.

Resolution: -200°C - 200°C 0.1°C; 800°C -1370°C 1°C
-200°F - 200°F 0.1°F; outside this range 1°F

Number of Sensor Inputs: Two Type K Thermocouples

Input Protection at Thermocouple Input: 60V DC or 24Vrms AC

Display: Dual 4 Digit Temperature Displays plus Indicators, see Section 3.0.

Sample Rate: 0.6 times per second

Power Requirement: 9 Volt Battery, NEDA 1604 or JIS 006P or IEC6F22

Battery Life: Approx. 150 hours with alkaline battery. Low battery indication.

Operating Conditions:

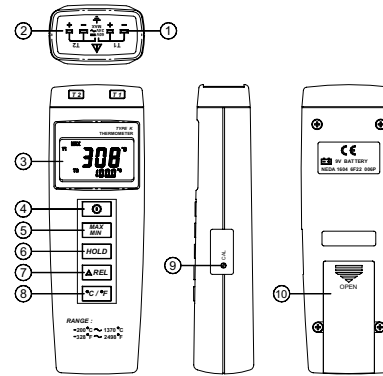
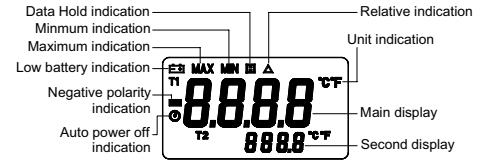
- Operating Temperature - Humidity: 0°C - 50°C (32°F - 122°F); 0 - 80% RH
- Storage Temperature - Humidity: -10°C - 60°C (14°F - 140°F); 0 - 80% RH
- Altitude up to 2000 meters (6500 feet)

Dimensions: 164×54×34 mm (6.5×2.1×1.3 in)

Weight: Approx. 180g (6.3 oz)

Accessories: Type K Wire Thermocouple Probe, Battery, Instruction Manual

3.0 Symbol Definitions and Feature Locations:




- 1) T1 Type K temperature probe input
- 2) T2 Type K temperature probe input
- 3) LCD display
- 4) ON/OFF button
- 5) MAX MIN control button
- 6) HOLD button
- 7) Relative readout button
- 8) °C, °F control button
- 9) Offset calibration screw
- 10) Battery cabinet cover

4.0 Operating Instructions

4.1 Preparation for Measurement

Plug the first thermocouple into the socket marked **T1**, taking care to observe the polarity of the thermocouple pins. If dual sensors are being used, plug the second thermocouple into the socket marked **T2**.

4.2 Power

Press the  button to turn the thermometer ON or OFF.

4.3 Selecting the Temperature Scale

When first turned on, the instrument defaults to reading in Fahrenheit (°F). The instrument toggles between Fahrenheit (°F) and Celsius (°C) each time the °C/°F button is pressed.

4.4 Data-Hold Function

The present reading is held on the display by pressing the **HOLD** button. Pressing the **HOLD** button again releases the hold function and returns the instrument to continuous reading.

In the **HOLD** mode, the **ΔREL**, **MAX/MIN** and °C/°F buttons are disabled, as indicated by two consecutive beeps when pressed.

4.5 Relative Operation

Pressing the **ΔREL** button zeroes the display and internally stores the present reading as a reference for subsequent measurements. The main display now shows the difference between the stored value and the new reading.

Press the **ΔREL** button again to exit the Relative mode.

4.6 MAX/MIN Operation

Press the **MAX MIN** button to enter the MAX/MIN mode. In this mode, the maximum and minimum values are simultaneously retained in memory and updated with every new data sample. The instrument first enters the MAX mode, and the **MAX** symbol and value are both displayed. Pressing **MAX MIN** again advances the display to the **MIN** symbol and value. The next press of the **MAX MIN** button will cause both the MAX and MIN symbols to flash. This indicates that the maximum and minimum values have been updated in memory and the displayed reading is the present temperature. Each successive press of the **MAX MIN** button circulates the display mode among these options. To exit the MAX/MIN mode, press and hold the **MAX MIN** button for two seconds.


In the MAX/MIN mode, the **ΔREL** and °C/°F buttons are disabled, as indicated by two consecutive beeps when pressed.

4.7 Auto Power Off

By default, the instrument powers on in the 'Auto Power Off' mode and will automatically shut off 30 minutes after the last key operation.

To disable this feature, press and hold the **HOLD** button and then power on the meter. Two successive beeps indicate that 'Auto Power Off' is disabled.

4.8 Low Battery Condition

When the battery voltage is at or below the minimum for proper operation, the  symbol will show on the display indicating that the battery must be replaced.

4.9 Calibration

Calibration is conducted by adjusting the following potentiometers to within the tolerances shown.

(Ambient Temperature: 23 ± 3°C)

Input	Adjust VR	Tolerance
0 °C	VR3	± 0.1 °C
190 °C	VR2	± 0.1 °C
1000 °C	VR1	± 1 °C
1900 °F	VR4	± 1 °F

A simple single point calibration may be performed by adjusting VR3 to 0 °C with thermally stabilized ice water.

Appendix: Thermocouple Probe Specifications

Model	Range	Tolerances	Description
TP-K01	-50°C to 200°C	±2.2°C or ±0.75%	Teflon insulation. Maximum
Wire probe	-58°F to 392°F	(±3.6°F or ±0.75%)	insulation temperature: 260°C

TP-K01:

Probe for general condition measurements, especially for complex and hard to reach places.

